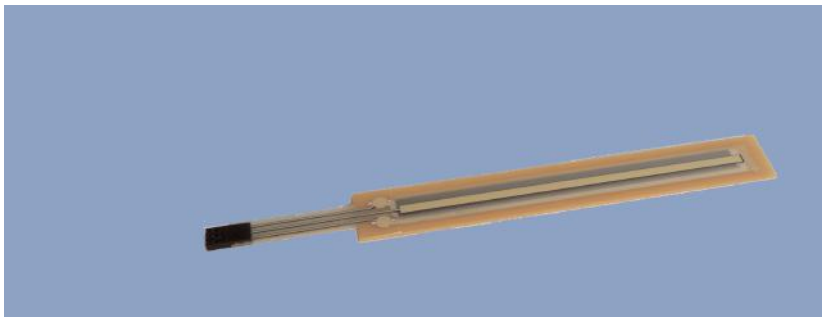
NOVOFOIL Potentiometric Sensors with membrane collector

Series LFP



Special features

- Flat profile
- Resistant to dirt, dust or liquid
- Very robust
- Very good linearity: to <±0.3 %
- Long life
- Operating temperature up to +125° C
- Protection class IP 67

Technology

The sensors for linear position measurement consist of an FR4 substrate and a collector foil, which are separated by a spacer.

On the FR4 substrate, the potentiometer track is applied with a screen-printing process. On the opposite side of the collector foil, a low-ohmic collector track is printed. Mechanical pressure, from a pin, puts the potentiometer track in contact with the collector track.

With a subsequent linearization step, very good linearity values can be achieved over a lifetime of over 25 million movements.

Benefits

When using the pin operated version, a cover layer absorbs the forces of the actuating pin, to enable the sensor to be operated up to +125° C.

Polyester based solutions, available in competitive products on the market today, do not withstand these temperatures. They are not linearized and are also very sensitive to small dust particels between the sensor and the adhesive surface which can lead to failures.

LFP Series membrane sensor potentiometers are very flat and can be glued to plane surfaces in the required form.

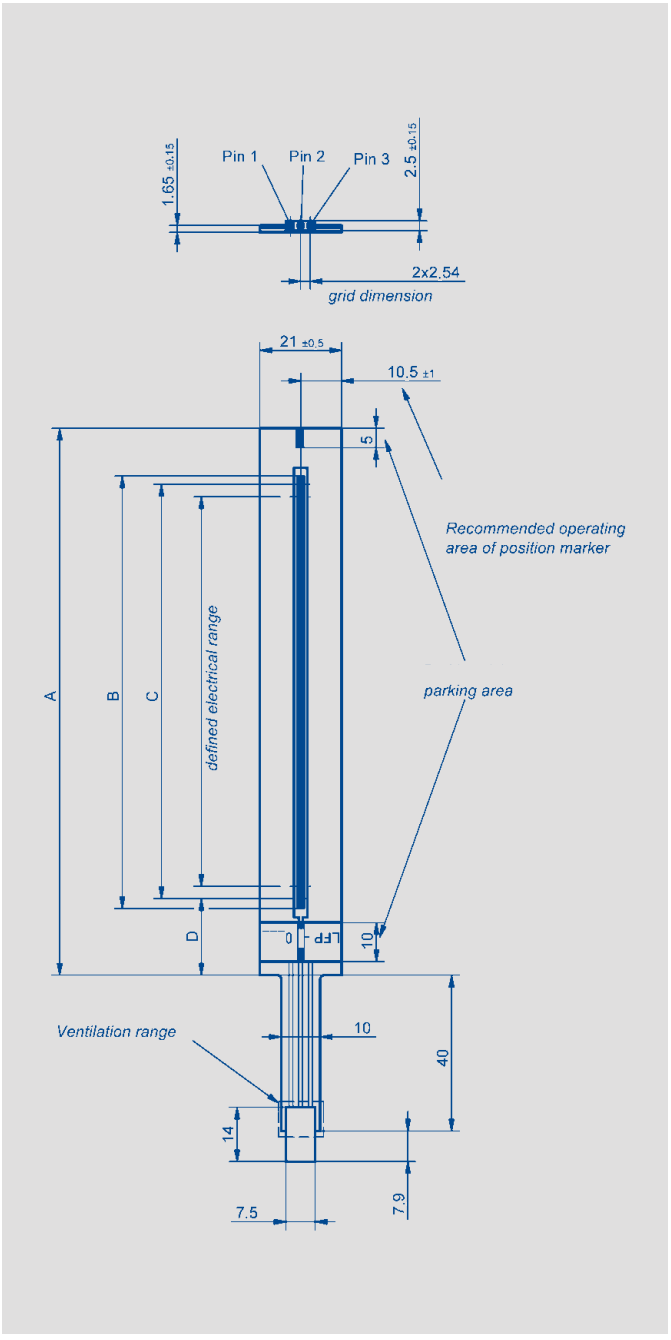
Another advantage of LFP Series is the hermetically sealed structure of the membrane sensor potentiometer. Dirt, dust or humidity can not invade the sensor and therefore they can be used in a harsh environment. Handling is not an issue since the sensitive potentiometer track is protected by the cover sheet.

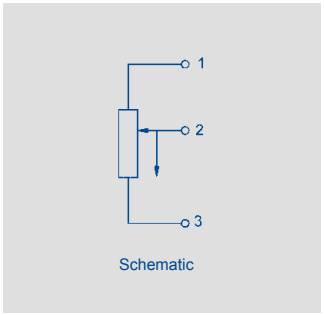
Applications

Adjustment systems in car and truck seats, window lifter, convertible tops, mirror systems, medical devices, positioning of solar panels, robot systems, valve actuators can use these sensors.

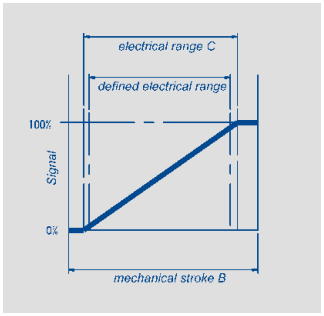
Description

Substrate	Glass filled epoxy
Fixings	Flipside adhesive film
Position marker	Pressure pin, stainless steel with external thread M6 and pressed-in POM-ball with spring
Resistance element and collector	Conductive plastic
Electrical connections	Flex wire 40 mm with 3-pin female connector, Pitch 2.54 mm Socket housing: Crimpflex OF 03 Female contacts: Crimpflex 11506-12

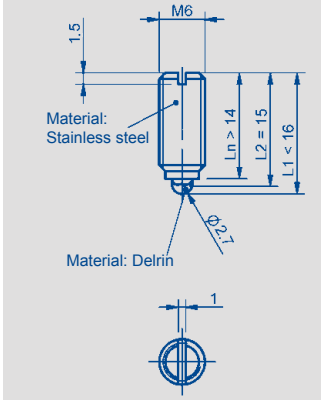


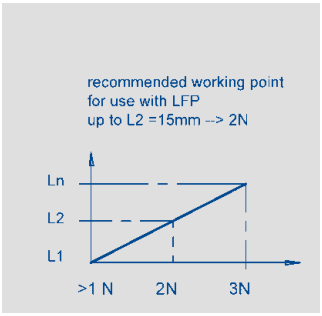


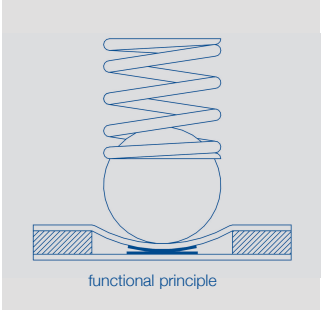
Schematic



optional accessories







functional principle

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Subject to changes.

Type designations	LFP-0050	LFP-0100	LFP-0150	LFP-0200	LFP-0250	LFP-0300	LFP-0350	LFP-0400	LFP-0450	LFP-0500	
Electrical Data											
Defined electrical range	Standard 50 mm up to 500 mm in 50 mm steps,										mm
Electrical range	56.2	106.4	156.6	206.8	257.0	307.2	357.4	407.6	457.8	508.0	±0.2 mm
Total resistance	2	4	6	8	10	12	14	16	18	20	kΩ
Resistance tolerance	20										±%
Independent linearity	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	±%
Repeatability	typ. 0.05										mm
Hysteresis	typ. 0.25										mm
Recommended operating wiper current	≤ 1										µA
Max. wiper current in case of malfunction	5										mA
Max. permissible applied voltage	30										V
Temperature coefficient of the output-to-applied voltage ratio	typ. 15										ppm/K
Insulation resistance (500 VDC)	≥ 10										MΩ
Dielectric strength (500 VAC, 50Hz)	≤ 100										µA
Mechanical Data											
Mechanical range (dimension B)	60.2	110.4	160.6	210.8	261.0	311.2	361.4	411.6	461.8	512.0	±2 mm
Length element (dimension A)	89.6	140.4	191.2	242.0	292.8	343.6	394.4	445.2	496.0	546.8	±0.5 mm
Initial zone (dimension D)	19.3	19.6	19.9	20.2	20.5	20.8	21.1	21.4	21.7	22.0	±1 mm
Width element	21								±0.5 mm		
Thickness element	1.65										±0.15 mm
Environmental Data											
Temperature range	-25...+105; -40...+125 with limited performance									°C	
Operating humidity range	0...95 (no condensation)										% R.H.
Vibration DIN IEC 68T2-6	5...2000 A_{max} = 0.75 a_{max} = 20										Hz mm g
Shock DIN IEC 68T2-27	50 11										g ms
Life	> 25 x 10^6										movements
Adjustment speed	1.0										m/s max.
Pressure force position marker	2										±1 N
Protection class DIN EN 60529	IP 67, except electrical connection										

Order designations

Type	Art.-No.
LFP-0050-001-001-001	043502
LFP-0100-001-001-001	043504
LFP-0150-001-001-001	043506
LFP-0200-001-001-001	043508
LFP-0250-001-001-001	043510

Type	Art.-No.
LFP-0300-001-001-001	043512
LFP-0350-001-001-001	043514
LFP-0400-001-001-001	043516
LFP-0450-001-001-001	043518
LFP-0500-001-001-001	043520

other lengths on request.

Recommended accessories

Pin Z-LFP-P01,
Art.No. 070301.

Important

All values specified in this data sheet for linearity, lifetime and temperature coefficient are only valid for a sensor used as a voltage divider with virtually no load applied to the wiper ($I_e \leq 1$ µA).
In case of longer standstill periods of position marker at a position, it can lead to change in the linearity. Therefore, in case of longer standstill periods, it is recommended not “parking” the position marker in the electrical field.